

Auric Enterprises, Inc.
d/b/a Thorn Smith Laboratories
7755 Narrow Gauge Rd.
Beulah, MI 49617-9792
231-882-4672

MATERIAL SAFETY DATA SHEET

FOR

THORN SMITH LABORATORIES QUALITATIVE UNKNOWNNS

WARNING! Thorn Smith Laboratories Qualitative Unknownns are for educational use only.

WARNING! Thorn Smith Laboratories Qualitative Unknownns are to be used only under the direct supervision of a chemistry instructor familiar with the proper use and hazards associated with these chemicals.

WARNING! Before using Thorn Smith Laboratories Qualitative Unknownns, students must be trained in the proper use and hazards associated with these chemicals.

NOTE: Section 1 of this Material Safety Data Sheet lists the chemical components which are present in reportable quantities (i.e. 0.1% for carcinogens and 1.0% for other health hazards). Partially or completely dissociated forms of these components are present in the Thorn Smith Laboratories Qualitative Unknownns.

The information published in this Material Safety Data Sheet has been compiled from our experience and data presented in various technical publications. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions. We make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and assume no liability resulting from its use. We reserve the right to revise Material Safety Data Sheets periodically as new information becomes available.

**MATERIAL SAFETY DATA SHEET
FOR
THORN SMITH LABORATORIES
LIQUID QUALITATIVE UNKNOWNNS**

SET V
(Fe⁺³; Fe⁺²; Al⁺³; AlO₂⁻; Cr⁺³; CrO₄⁻²; Mn⁺²; Ni⁺²; Ni(NH₃)₄⁺²; CO⁺²; Zn⁺²; Zn(NH₃)₄⁺²; ZnO₂)
25 Varieties

Manufacturer: Thorn Smith Laboratories
Address: 7755 Narrow Gauge Road
Beulah, MI 49617
Phone Number: 231-882-7251
MSDS Number: TSL-Q05
Date Prepared: July 6, 1989
Date Updated: June 7, 2006

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS - Chemical Name & Common Names

(Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	Maximum %
Aluminum Chloride hexahydrate	4.01
Formula: AlCl ₃ ·6H ₂ O	
CAS No.: 7784-13-6**	
Reference CAS No.: 7429-90-5 (Aluminum Compounds)	
OSHA PEL: TWA = 2 mg/m ³	
ACGIH TLV: TWA = 2 mg/m ³	
OTHER LIMITS: N/A	
Ammonium Hydroxide	25.00
Formula: NH ₄ OH	
CAS No.: 1336-21-6***	
OSHA PEL: * ACGIH TLV: * OTHER LIMITS: N/A	
Chromium Chloride hexahydrate	2.57
Formula: [Cr(H ₂ O) ₄ Cl ₂]Cl·2H ₂ O	
CAS No.: 10060-12-5**	
Reference CAS No.: 16065-83-1 (Chromium Compounds)	
OSHA PEL: TWA = 0.5 mg/m ³	
ACGIH TLV: TWA = 0.5 mg/m ³	
OTHER LIMITS: N/A	

Hydrochloric Acid	7.65
Formula: HCl	
CAS No.: 7647-01-0	
OSHA PEL: Ceiling = 5 ppm, 7 mg/m ³	
ACGIH TLV: Ceiling = 5 ppm, 7 mg/m ³	
OTHER LIMITS: N/A	
Iron(III) Chloride hexahydrate	4.48
Formula: FeCl ₃ ·6H ₂ O	
CAS No.: 10025-77-1**	
Reference CAS No.: SEQ-17-8 (Iron Compounds)	
OSHA PEL: TWA = 1 mg/m ³	
ACGIH TLV: TWA = 1 mg/m ³	
OTHER LIMITS: N/A	
Iron(II) Chloride tetrahydrate	1.68
Formula: FeCl ₂ ·4H ₂ O	
CAS No.: 13478-10-9**	
Reference CAS No.: SEQ-17-8 (Iron Compounds)	
OSHA PEL: TWA = 1 mg/m ³	
ACGIH TLV: TWA = 1 mg/m ³	
OTHER LIMITS: N/A	
Manganese Dichloride tetrahydrate	4.81
Formula: MnCl ₂ ·4H ₂ O	
CAS No.: 13446-34-9	
Reference CAS No.: 7439-96-5 (Manganese Compounds)	
OSHA PEL: Ceiling = 5 mg/m ³	
ACGIH TLV: Ceiling = 5 mg/m ³	
OTHER LIMITS: N/A	
Nickel Chloride hexahydrate	0.93
Formula: NiCl ₂ ·6H ₂ O	
CAS No.: 7791-20-0**	
Reference CAS No.: 7440-02-0 (Nickel Compounds)	
NTP anticipated human carcinogen. IARC human carcinogen (Group 1).	
OSHA PEL: TWA = 0.1 mg/m ³	
ACGIH TLV: TWA = 0.1 mg/m ³	
OTHER LIMITS: N/A	
Potassium Dichromate	0.95
Formula: K ₂ Cr ₂ O ₇	
CAS No.: 7778-50-9**	
Reference CAS No.: 7440-47-3 (Chromium Compounds)	
NTP human carcinogen.	
OSHA PEL: TWA = 1 mg/m ³	
ACGIH TLV: TWA = 0.5 mg/m ³	
OTHER LIMITS: N/A	

Potassium Hydroxide	7.34
Formula: KOH	
CAS No.: 1310-58-3	
OSHA PEL: Ceiling = 2 mg/m ³	
ACGIH TLV: Ceiling = 2 mg/m ³	
OTHER LIMITS: N/A	
Sodium Hydroxide	4.72
Formula: NaOH	
CAS No.: 1310-73-2	
OSHA PEL: Ceiling = 2 mg/m ³	
ACGIH TLV: Ceiling = 2 mg/m ³	
OTHER LIMITS: N/A	
Zinc Chloride	2.32
Formula: ZnCl ₂	
CAS No.: 7646-85-7	
OSHA PEL: TWA = 1 mg/m ³ , STEL = 2 mg/m ³	
ACGIH TLV: TWA = 1 mg/m ³ , STEL = 2 mg/m ³	
OTHER LIMITS: N/A	

N/A Not Applicable.

* According to our sources, exposure threshold levels have not been established for this chemical.

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*** According to our sources, exposure threshold levels have not been established for this chemical. A Reference CAS No. could not be identified.

SECTION 2 - PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling Point: 212°F +

Specific Gravity (H₂O=1) approximately 1.0 +

Vapor Pressure (mm Hg and Temperature): Similar to water

Melting Point: Slightly less than 32°F

Vapor Density (Air=1): Similar to water

Evaporation Rate (=1): Similar to water.

Solubility in water: Yes

Water Reactive: No

Appearance and Odor: Clear, colorless, odorless (except for Sets IV, V, & XI, which are colored).

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

Flash Point and Method Used: N/A

Auto-Ignition Temperature: N/A

Flammability Limits in Air (% by Volume): N/A

LEL: N/A

UEL: N/A

Extinguisher Media: Use extinguishing media appropriate for surrounding fire.

Special Fire Fighting Procedures: Firefighters should wear proper protective equipment and self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Toxic fumes may be produced when heated to decomposition.

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: Stable Unstable

Conditions to Avoid: Heat and Sunlight

Incompatibility (Materials to avoid): N/A

Hazardous Decomposition Products: Toxic fumes may be produced when heated to decomposition.

HAZARDOUS POLYMERIZATION: May Occur Will Not Occur

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY:

Inhalation Ingestion Skin Contact

Eye Contact Not Hazardous

CARCINOGEN LISTED IN: * See Section I

NTP OSHA IARC Monograph Not Listed

HEALTH HAZARDS - Acute:

Ingestion: Ingestion and skin absorption are harmful and can be fatal.

Skin Contact: Ingestion and skin absorption are harmful and can be fatal.

HEALTH HAZARDS - Chronic:

Ingestion: Ingestion and skin absorption are harmful and can be fatal.

Skin Contact: Ingestion and skin absorption are harmful and can be fatal.

Signs and Symptoms of Exposure: Heavy Metal Poisoning.

Medical Conditions Generally Aggravated by Exposure: None Reported.

EMERGENCY FIRST AID PROCEDURES - Seek medical assistance for

further treatment, observation and support if necessary.

Inhalation: If a person breathes in large amounts, move the person to fresh air. Get medical attention.

Ingestion: If person is conscious and not convulsive, immediately induce vomiting under physician's directions.
Get medical attention immediately.

Skin Contact: Remove contaminated clothing and shoes immediately. Wash skin with soap and large amounts of water for at least 15 minutes. Get medical attention.

Eye Contact: Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (Specify Type): None required where adequate ventilation conditions exist.

Protective Gloves: Wear appropriate protective gloves.

Eye Protection: Wear safety goggles.

VENTILATION TO BE USED: Use adequate general or local exhaust ventilation to meet TLV requirements.

Local Exhaust Mechanical (General) Special

Other (Specify) Provide local exhaust ventilation to meet published exposure limits.

Other Protective Clothing and Equipment: Wear appropriate protective clothing.

Hygienic Work Practices: Wash hands thoroughly with soap and water after use. No eating in area.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE/LEAK PROCEDURES

Steps to be taken if material is spilled or released: Wear appropriate protective clothing. Carefully collect and place in waste container. Wash area with soap and water.

Waste Disposal Methods: Dispose in accordance with all applicable local, state, and federal environmental regulations.

Precautions to be taken in handling and storage: Observe all applicable local, state and federal environmental regulations when storing and disposing of this substance.

Other precautions and/or special hazards: Protect container against physical damage. Keep container tightly closed.

Do not store near food. Avoid heat and sunlight.

NFPA Rating: No information available.

HMIS Rating: No information available.

SECTION 8 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

Domestic (D.O.T.)

Proper Shipping Name: Chemicals, n.o.s. (Non-regulated)

International (T.M.O.)

Proper Shipping Name: Chemicals, n.o.s. (Non-regulated)

AIR (I.C.A.O.)

Proper Shipping Name: Chemicals, n.o.s. (Non-regulated)

Per section 172.101 of 49 CFR Chapter 1, this material is a mixture of a hazardous material and a non-hazardous material and can be shipped as a n.o.s. Actual mixture quantities are identified on the analysis sheet which accompanies every shipment.

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